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| 09/672,050 | 09/29/2000 | Scott L. Broutin | Broutin 31-35-50 | 2996 |
| 24998 | 7590 | 12/16/2003 | EXAMINER | |
| DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP | | | MONBLEAU, DAVIENNE N | |
| 2101 L STREET NW | | | ART UNIT | |
| WASHINGTON, DC 20037-1526 | | | PAPER NUMBER | |
| | | | 2878 | |

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/672,050

Applicant(s)

BROUTIN ET AL.

Examiner

Davienne Monbleau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-20 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment filed 9/30/03 has been entered. Claims 1, 2, 11, 13-16 and 19 have been amended. Claims 1-20 are pending.

The Applicant's arguments filed on 9/30/03 regarding Claims 11-20 have been carefully considered and found persuasive in light of the corresponding amendment.

Regarding Claims 11-14, the Applicant argues in the response filed 9/30/03 on pages 11-12 that even assuming, *arguendo*, there is "motivation to in the prior art to modify Bielas by replacing the original data stored in Bielas with mode-hopping data, operation of Bielas' method as thus modified would result in the application of drive current to the laser device at precisely one of the unstable mode-hopping values." There is no subsequent calculation that refers to the mode-hopping values (look-up table) and the generated curve data, which Claim 11, as amended, now requires.

Regarding Claims 15-18, the Applicant argues on page 12 that the cited prior art of record does not teach "ramping the tuning current through a predetermined range of values for a desired operating wavelength, and then generating a data curve to represent the relationship between the tuning current and the amplitude of a signal output from the laser device". The cited prior art of record, in particular Bielas, teaches that the look-up table is programmed into the memory prior to any operation of the laser: there is no subsequent data generated during the operation.

Regarding Claims 19-20, the Applicant argues on pages 13-14 that the cited prior art of record does not teach adjusting three different parameters during the operation of the laser

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device: namely a gain current, a tuning current, and a wavelength characteristic. The cited prior art of record, namely Bielas, only teaches adjusting two parameters to maintain stable operation of the laser. Claim 19, as amended, has three separate feedback loops.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burbidge et al. (U.S. Patent No. 6,101,200) in view of Johnson (U.S. Patent No. 5,832,014). Regarding Claim 1, Burbidge et al. teach in Figure 2 a method of operating a laser comprising a first feedback loop (3) to adjust a characteristic of said laser device in response to a sensed wavelength and a second feedback loop (2) to adjust a current applied to said laser in response to a sensed amplitude, wherein both feedback loops operate simultaneously. Although Burbidge et al. teach in column 5 lines 30-32 that said current is continuously adjusted, since the purpose of the second feedback loop (2) is maintain a desired power level, adjustments will only be made when necessary; this may result in periodic adjustments. Burbidge et al. further teach in column 1 lines 10-20 that semiconductor lasers may be used, but do not teach a DBR laser. Johnson teaches in column 1 lines 5-20 that said laser might be a DBR. It would have been obvious to one of ordinary skill in the art to apply the tuning methods in Burbidge et al. to a DBR, as taught by Johnson, because DBRs are semiconductor lasers and may be used in communication devices.

Regarding Claim 2, Burbidge et al. teach in Figure 2 adjusting the temperature (3) of said laser in response to said sensed wavelength.

Regarding Claim 3, Johnson teaches in Figure 1 a stabilized laser device comprising a DBR laser (12) with a gain section (14) and a tuning section (16). It would have been obvious to one of ordinary skill in the art at the time of the invention to tune the gain section of a laser, as taught by Johnson, to further stabilize the laser source.

Regarding Claim 4, Burbidge et al. teach in Figure 2 that lasers may be tuned in response to the output amplitude/power.

Regarding Claim 5, Burbidge et al. teach that said feedback loops (2 and 3) operate simultaneously. Therefore, it is logical that a third feedback loop may also operate simultaneously.

Regarding Claim 9, Burbidge et al. teach in Figure 2 calculating required adjustments based on a filtered power output (filtered by 10). Using an additional reference signal is

Regarding Claim 10, Johnson teaches in Figure 1 using a backface loop to compensate for aging, wherein said loop includes a backface monitor (20). (Also see abstract).

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burbidge et al. (U.S. Patent No. 6,101,200) in view of Johnson (U.S. Patent No. 5,832,014), as applied to Claim 2 above, and further in view of Kuo et al. (U.S. Patent No. 6,222,861). Regarding Claim 6, Burbidge et al. in view of Johnson teaches that there may be a third feedback loop, but does not teach that said third feedback loop operates an amplifier. Kuo et al. teach in Figure 1 a laser wavelength-controlling device comprising an amplifier (118). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a feedback loop to operate an

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amplifier associated with said laser, as taught by Kuo et al., to control the output power/amplitude of the device.

Regarding Claim 7, it is obvious that tuning the amplifier would be in response to an output power, since producing a specific output power is its function.

Regarding Claim 8, see discussion on Claim 5.

Allowable Subject Matter

Claims 11-20 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding Claims 11-14, the cited prior art of record does not teach or fairly suggest a method of starting-up a tunable light source comprising, along with the other claimed features, ramping a tuning current applied to said tunable light source, generating a data curve representing the relationship between the applied tuning current and the amplitude of a signal output from said tunable light source, storing said curve data, providing look-up data that is representative of mode-hopping values, and with reference to said look-up data and said generated curve data calculating a value representative of an optimal tuning current for said tunable light source.

Regarding Claims 15-18, the cited prior art of record does not teach or fairly suggest a method of operating a laser device in a plurality of wavelength channels comprising, along with the other claimed features, ramping a tuning current applied to said laser device for a first wavelength, generating and storing data curve representing the relationship between the applied tuning current and the amplitude of a signal output from said tunable light source for said first wavelength, ramping said tuning current applied to said laser device for a second wavelength,

generating and storing data curve representing the relationship between the applied tuning current and the amplitude of a signal output from said tunable light source for said second wavelength, and operating said laser at said first wavelength and then said second wavelength.

Regarding Claims 19-20, the cited prior art of record does not teach or fairly suggest a method of stabilizing a laser device comprising, along with the other claimed features, adjusting a gain current in response to signals output at the backface of said laser device to keep the power at a constant level, adjusting a tuning current in response to output power, and simultaneously adjusting a wavelength characteristic in response to an optically filtered transmission fraction of said output power.

The advantages of these features are in the specification on pages 1-3. In particular, the Applicant argues on page 8 that using three feedback loops allows a plurality of operating parameters to be efficiently controlled in a tunable laser device.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 9/30/03 regarding Claims 1-10 have been fully considered but they are not persuasive. In particular, the Applicant argues on page 9 that the cited prior art of record does not teach *periodically adjusting* a current applied to the laser in response to a sensed amplitude. Burbidge et al. teach in Figure 2 and in column 5 lines 15-36 that said APC module (2) responds to a power level (amplitude) of the laser and continually adjusts a current

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applied to the laser. Applicant argues that "continuously" is not "periodically". However, the Applicant further states on page 8 that "it is only necessary to adjust the tuning current when the operating conditions have drifted away from the desired parameters". Since the APC module (2) in Burbidge et al. adjusts the current to achieve a desired power level, it will only adjust said current when necessary to maintain that desired output. Thus, if the output power level is stable, no adjustment is necessary; this may result in periodic adjustments.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5,541,945.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 703-306-5803. The examiner can normally be reached on Mon-Fri 9:00 am to 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Danielle Monblanc

DNM



DAVID PORTA
SUPERVISORY PATENT EXAMINER
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